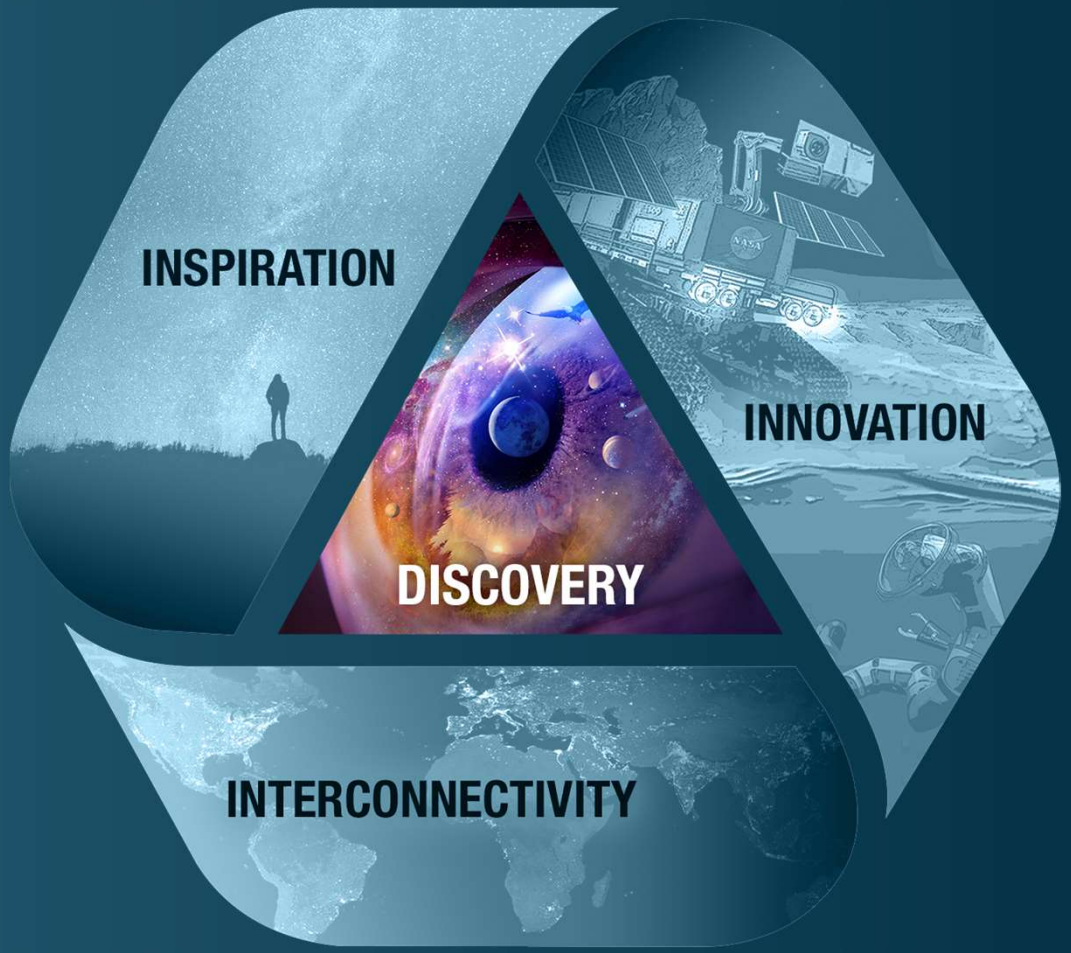
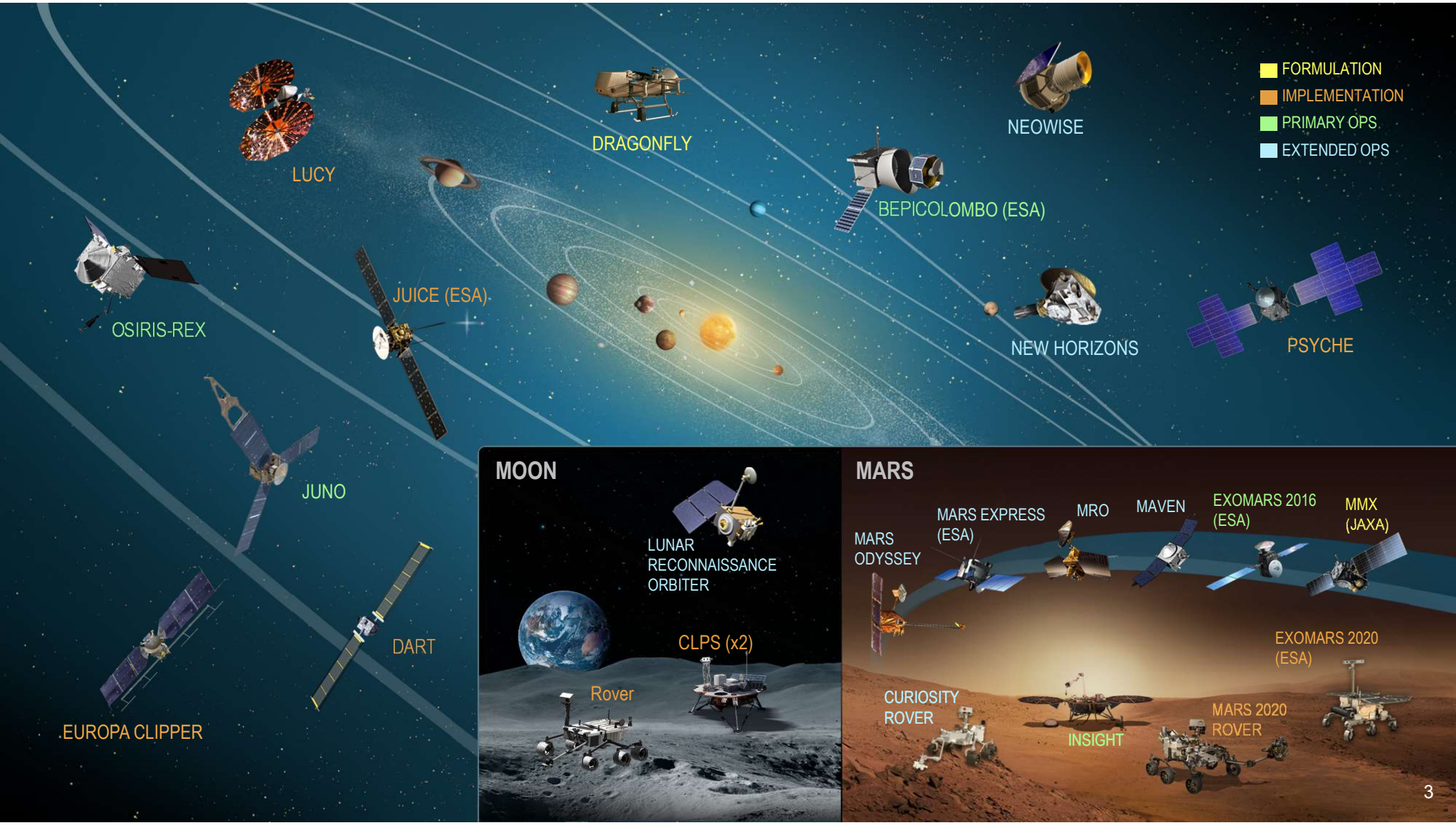
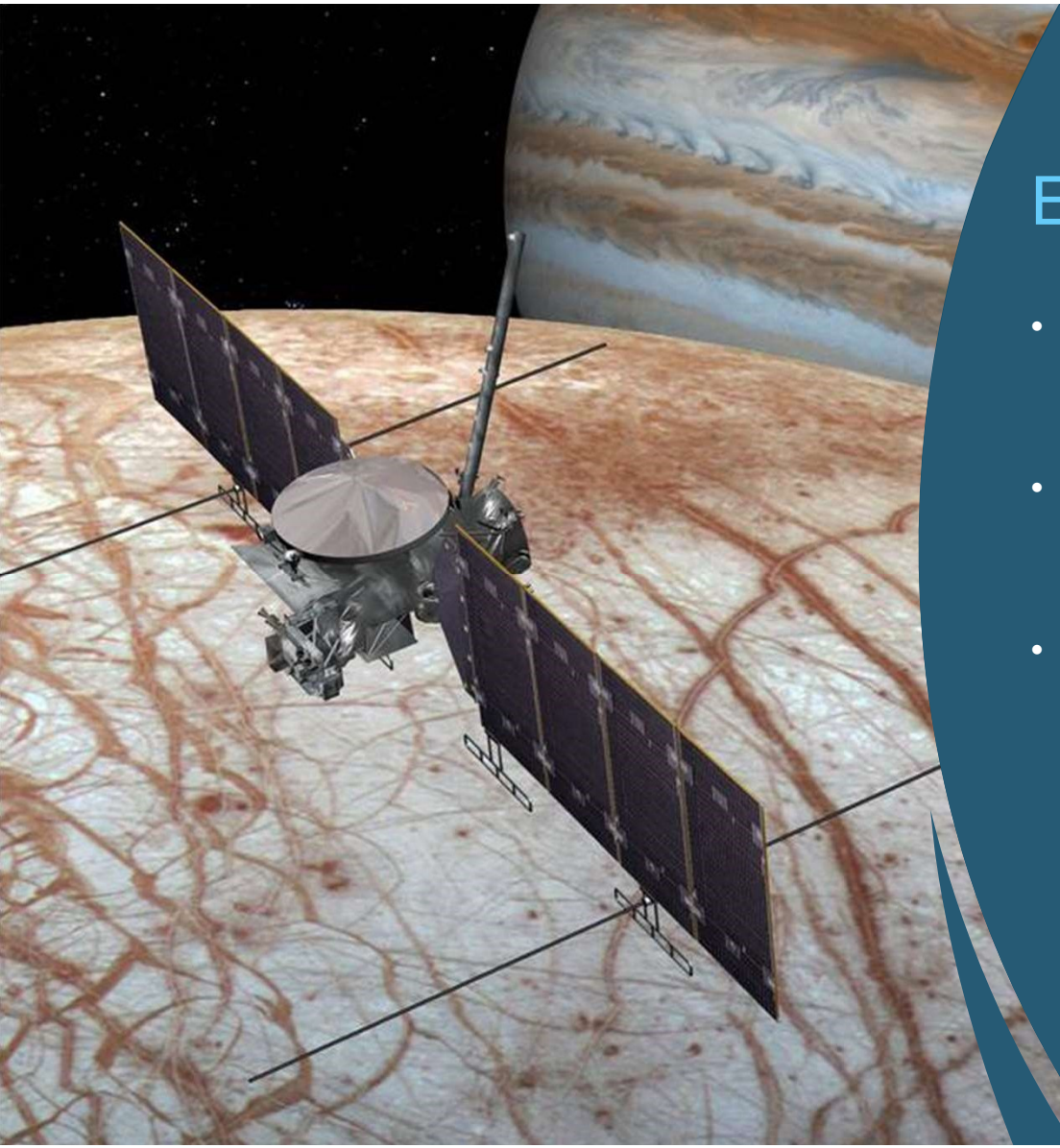
LORI S. GLAZE, Ph.D.
Planetary Science Division Director
PAC Meeting

September 23, 2019


INSPIRATION
INNOVATION
DISCOVERY
INTERCONNECTIVITY


FORMULATION
IMPLEMENTATION
PRIMARY OPS
EXTENDED OPS
LUCY
DRAGONFLY
NEOWISE
BEPICOLOMBO (ESA)
OSIRIS-REX
JUICE (ESA)
NEW HORIZONS
PSYCHE
JUNO
DART
EUROPA CLIPPER
MOON
LUNAR RECONNAISSANCE ORBITER
CLPS (x2)
Rover
MARS
MARS ODYSSEY
MARS EXPRESS (ESA)
MRO
MAVEN
EXOMARS 2016 (ESA)
MMX (JAXA)
EXOMARS 2020 (ESA)
CURIOSITY ROVER
INSIGHT
MARS 2020 ROVER


DRAGONFLY
NASA Selects New Frontiers 4 Mission
to Probe Titan for Origins and Signs of Life



Europa Clipper Confirmed!

- Mission to investigate Europa is one of the highest priorities for a flagship mission in last Decadal Survey
- Decadal Survey recommended mission's cost and science scope be reduced, which was successfully done
- Decadal Survey Midterm Review reaffirmed recommendations, and recommended NASA closely monitor cost to ensure it stays within its estimated range

Jupiter's Magnetic Field

Kimberly Moore, Rakesh Yadav, Hao Cao, Laura Kulowski & Jeremy Bloxham
Harvard University

John Connerney & Stavros Kotsiaros
NASA/GSFC

David Stevenson
California Institute of Technology

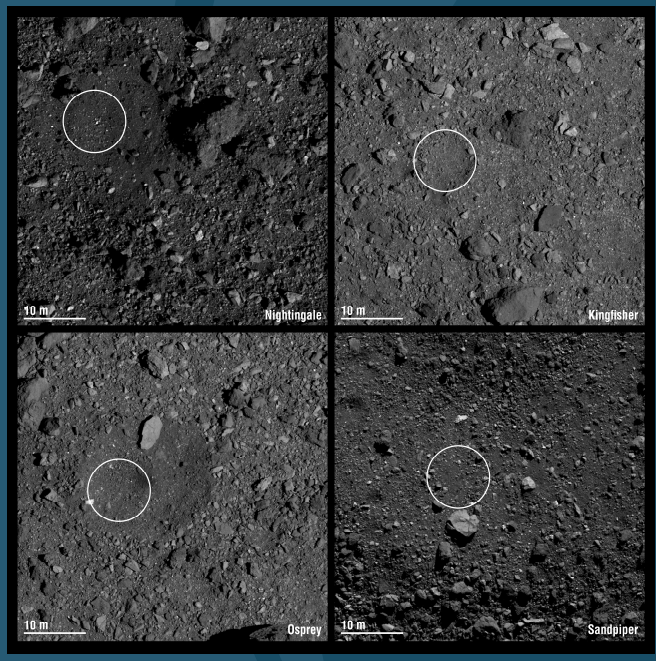
John Jorgensen & Jose Merayo
Technical University of Denmark

Steven Levin
Jet Propulsion Laboratory

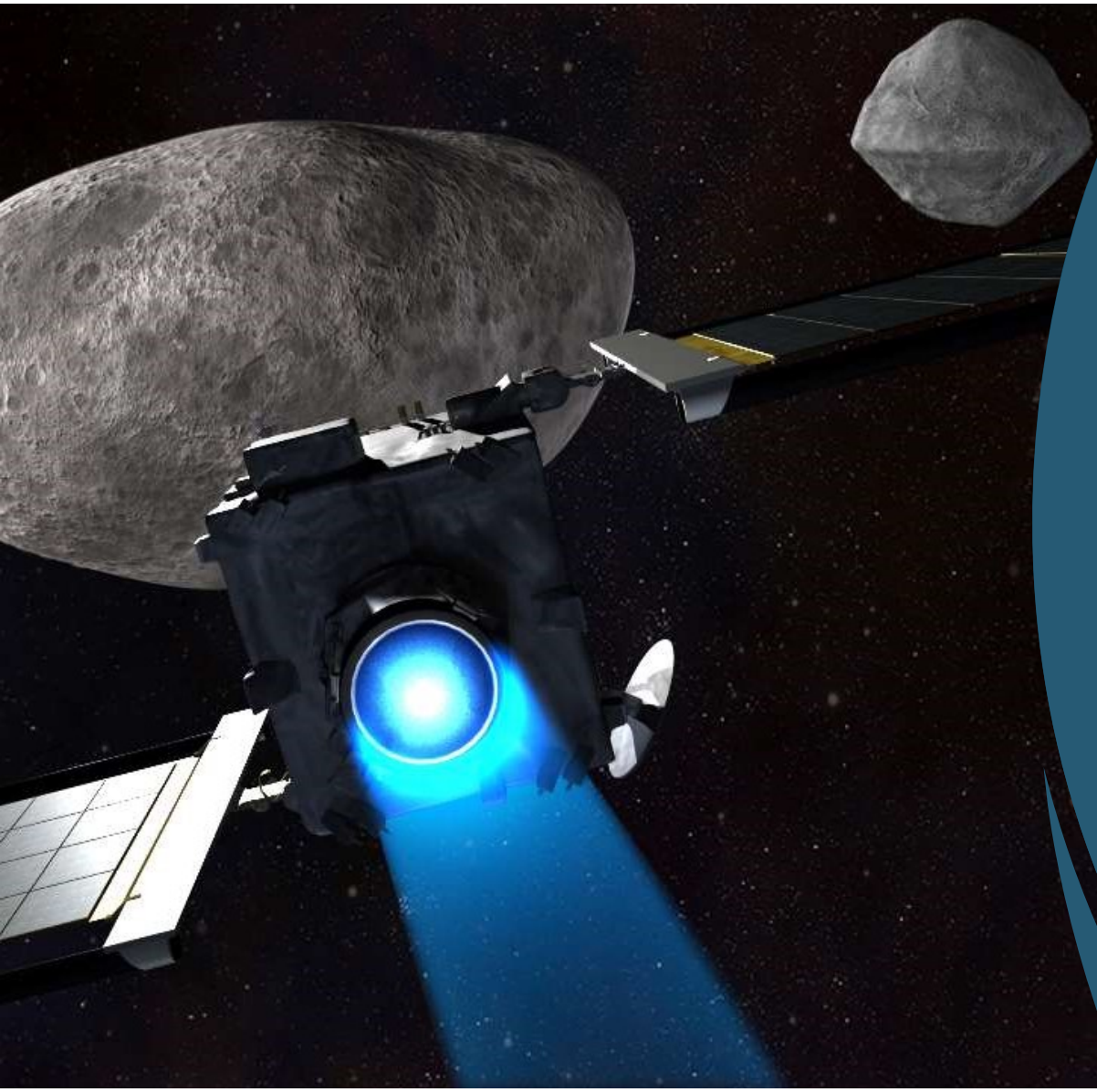
Scott Bolton
Southwest Research Institute

OSIRIS-REx

Bennu Arrival
December 3, 2018



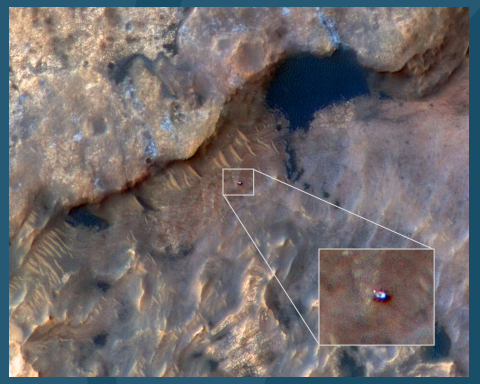
Aug. 12, 2019 - Four candidate sample collection sites on asteroid Bennu selected by NASA's OSIRIS-REx mission



Double Asteroid Redirection Test (DART)

- First-ever mission to demonstrate asteroid deflection technique for NASA's Planetary Defense Coordination Office
- Uses kinetic impact to change motion of asteroid in space
- Current DART target, Didymos, will have distant approach to Earth October 2022
- Successfully completed post-CDR SMD DPMC in August 2019
- Mission is on track for 2021 launch aboard a SpaceX Falcon 9

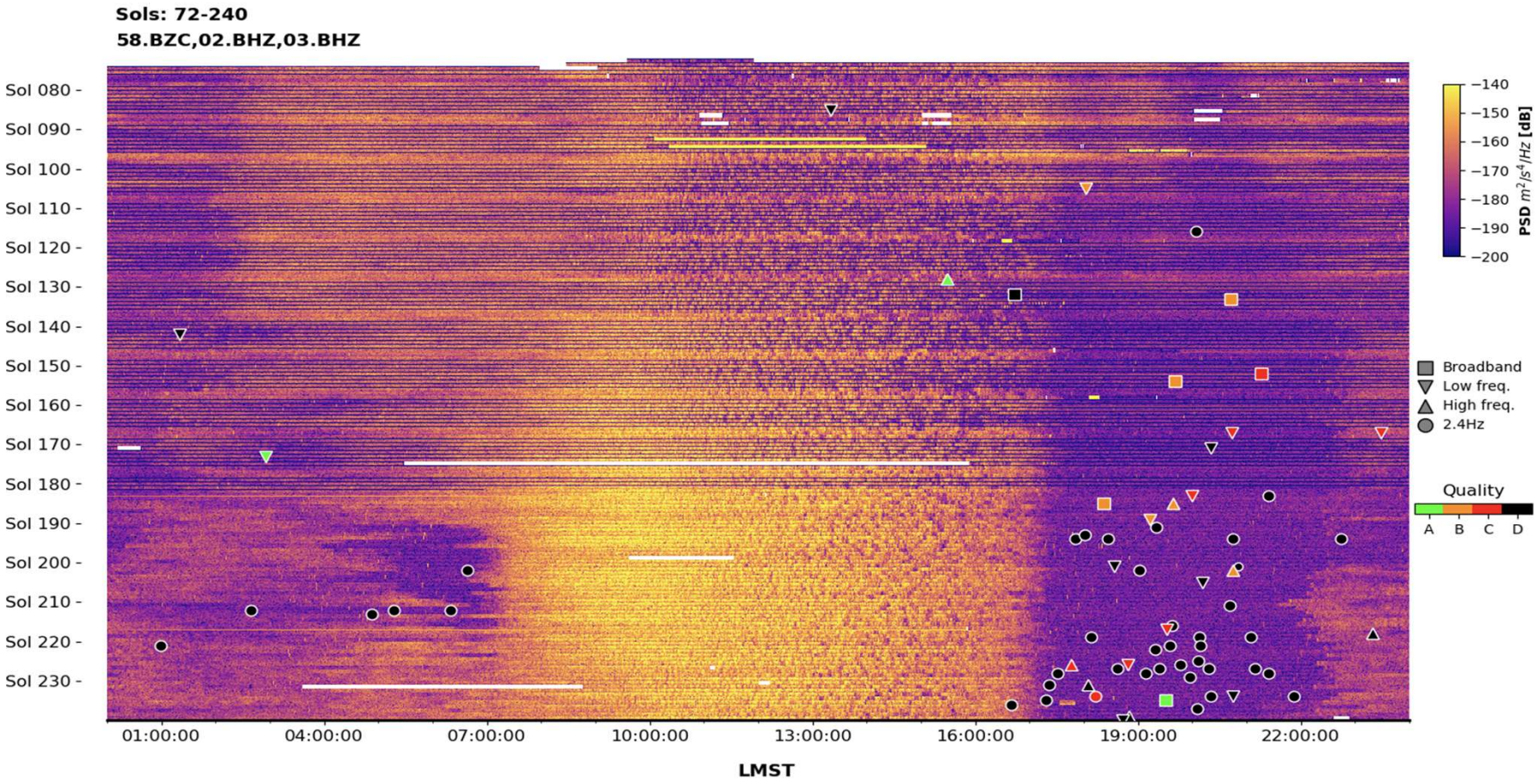
MSL Curiosity



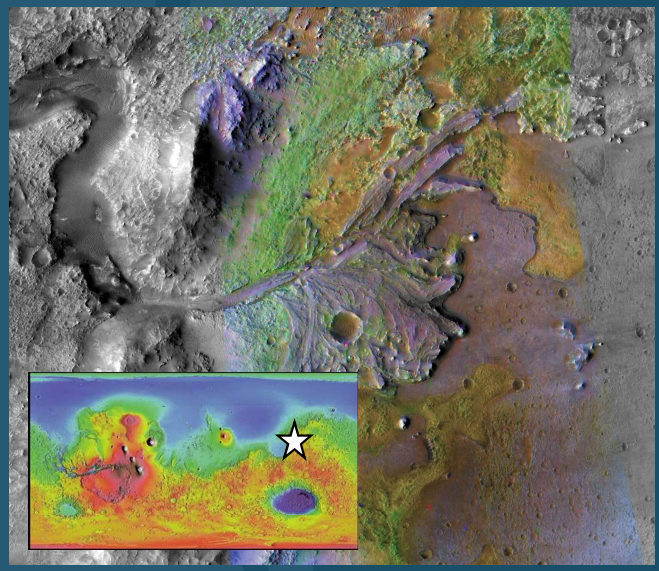
May 31, 2019 – MRO HiRISE spots Curiosity rover at Mars' Woodland Bay

Apr. 6, 2019 – Before and after images from Mastcam of first time Curiosity drilled in the clay-bearing unit

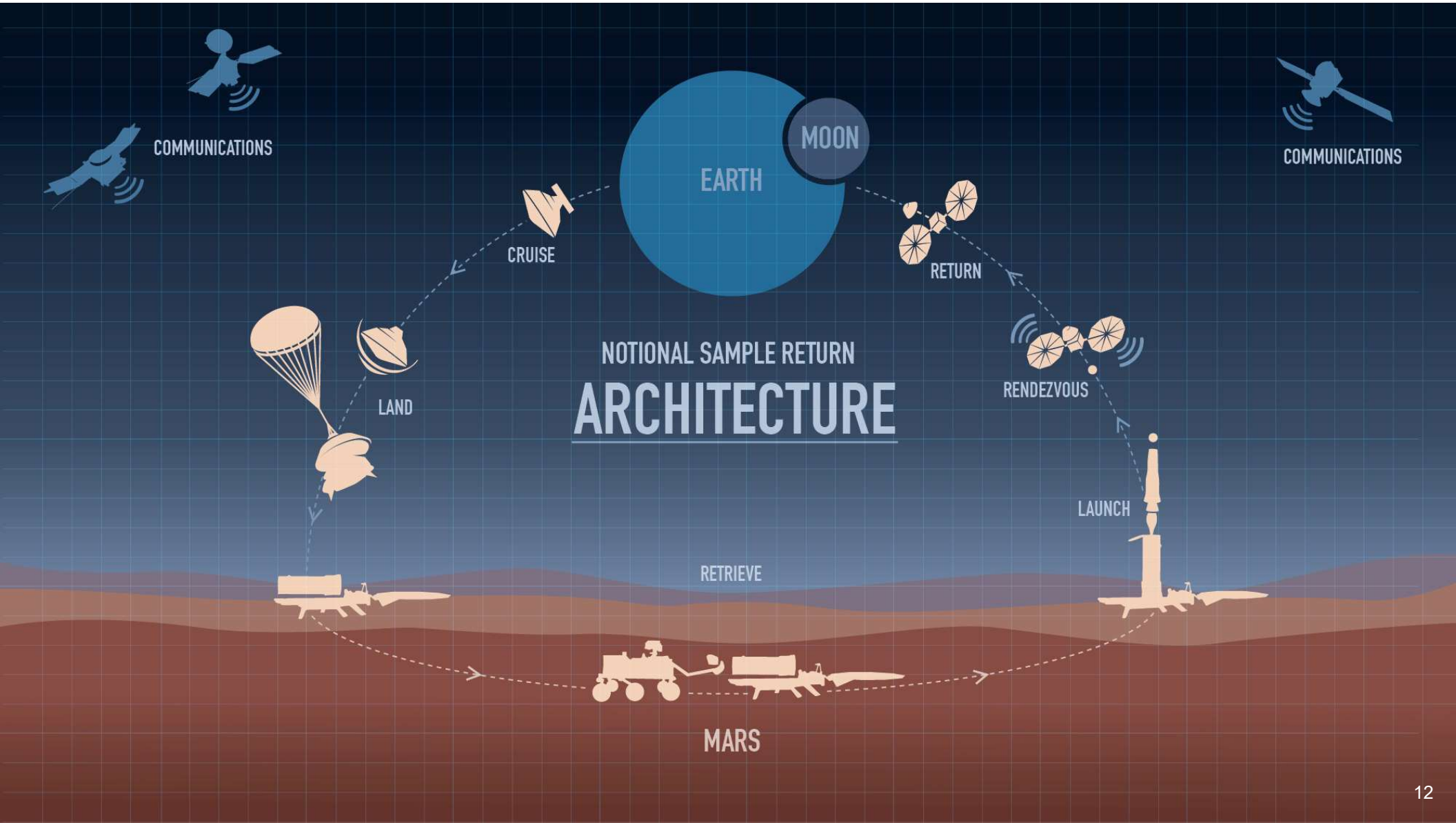
InSight Mission: All Detected Events (as of July 30)



Mars 2020



Jezero Crater will be the landing site for Mars 2020 Rover mission


COMMUNICATIONS
COMMUNICATIONS
MOON
EARTH
CRUISE
RETURN
LAND
NOTIONAL SAMPLE RETURN
ARCHITECTURE
RENDEZVOUS
LAUNCH
RETRIEVE
MARS

Mars Sample Return (MSR) Status

- Decadal MidTerm recommended that NASA continue planning and begin implementation of proposed MSR architecture
- Throughout 2018/2019: NASA/ESA have been converging campaign requirements, completing mission trade studies, refining mission concept designs, and maturing plans for jointly implementing MSR, potentially launching as early as 2026
- On April 26, 2018: NASA and ESA signed Joint Statement of Intent (SOI) at the Berlin Airshow to jointly develop plans for MSR by the end of 2019
- In July 2019, NASA conducted an Acquisition Strategy Meeting for MSR and ESA released an Invitation to Tender (ITT) for an Earth Return Orbiter (ERO)
- Studies have prepared NASA and ESA to make an informed decision on MSR late 2019 / early 2020

PSD Personnel Changes

- Jonathan Rall, Planetary Research Program Director, has accepted an opportunity as the Associate Chief Scientist (Programs & Projects) in NASA's Office of the Chief Scientist.
- While it is a huge loss, we are excited for this new chapter in his career and wish him the very best!
- As of September 3, Stephen Rinehart has been selected to serve a 6-month detail while PSD works to permanently fill this critical role.
- Thank you Kate Wolf for an incredible 7 months tenure as acting Division Deputy Director.
- We are happy to announce the confirmation of the new Deputy Division Director Eric Ianson who will start on September 30 and Associate Director for Flight Programs Joan Salute.

Planetary Science - ROSES18

Program Name	Step-1 Due Date	Step-2 Due Date	Panel Occurred	Selections/Submissions (Selection rate%)	Selection Date	Days from Step-2 to Select
Exobiology (EXOB)	04/16/2018	05/24/2018	Yes	23/156 (15%)	10/17	146
Exoplanets (XRP) Exoplanets (XRP) 2	03/29/2018 03/29/2019	05/30/2018 05/29/2019	Yes	16/117 (14%) XX/184	10/03	126
Emerging Worlds (EW)	04/12/2018	06/01/2018	Yes	29/110 (26%)	10/18	139
Development & Advance of Lunar Instruments (DALI)	04/03/2018	06/05/2018	Yes	10/48 (17%)	10/26	143
Solar System Obs. (SSO)	04/05/2018	06/07/2018	Yes	10/66 (15%)	03/11	277
MatISSE	04/18/2018	06/20/2018	Yes	8/56 (14%)	11/09	142
Laboratory Analysis of Returned Sample (LARS)	05/24/2018	07/26/2018	Yes	12/26 (46%)	04/30	278
Planetary Data Archiving, Restoration, Tools (PDART)	05/10/2018	07/12/2018	Yes	16/91 (18%)	11/19	130
Cassini Data Analysis (CDAP) C. 10 Cassini Data Analysis (CDAP) C. 26	06/01/2018	08/14/2018	Yes	18/61 (30%) 2/7 (29%)	03/18 03/31	216 114
New Frontiers Data Analysis Program (NFDAP)	06/12/2018	08/23/2018	Yes	10/25 (40%)	03/08	197
Apollo Next Generation Sample Analysis (ANGSA)	06/22/2018	08/21/2018	Yes	9/26 (35%)	03/11	202
Planetary Major Equipment/Facilities (PMEF)	07/17/2018	09/17/2018	Yes	XX/11	TBD	
Mars Data Analysis (MDAP)	08/23/2018	10/25/2018	Yes	24/103 (23%)	05/19	206
Discovery Data Analysis (DDAP)	08/30/2018	11/01/2018	Yes	6/22 (27%)	06/14	225
Rosetta Data Analysis Program (RDAP)	08/30/2018	11/01/2018	Yes	7/23 (30%)	06/19	230
PICASSO	09/20/2018	11/20/2018	Yes	11/91 (12%)	04/29	160
Habitable Worlds (HW)	11/15/2018	03/29/2019	Yes	XX/60	TBD	
Solar System Workings (SSW)	11/15/2018	04/02/2019	Yes	XX/338	TBD	
Lunar Data Analysis (LDAP)	11/29/2018	03/29/2019	Yes	XX/37	TBD	
Korean Pathfinder Lunar Orbiter (KPLO)	04/11/2019	06/11/2019	No	XX/26	Nov 4-8	
Planetary Protection Research (PPR)	04/12/2019	05/10/2019	No		TBD	

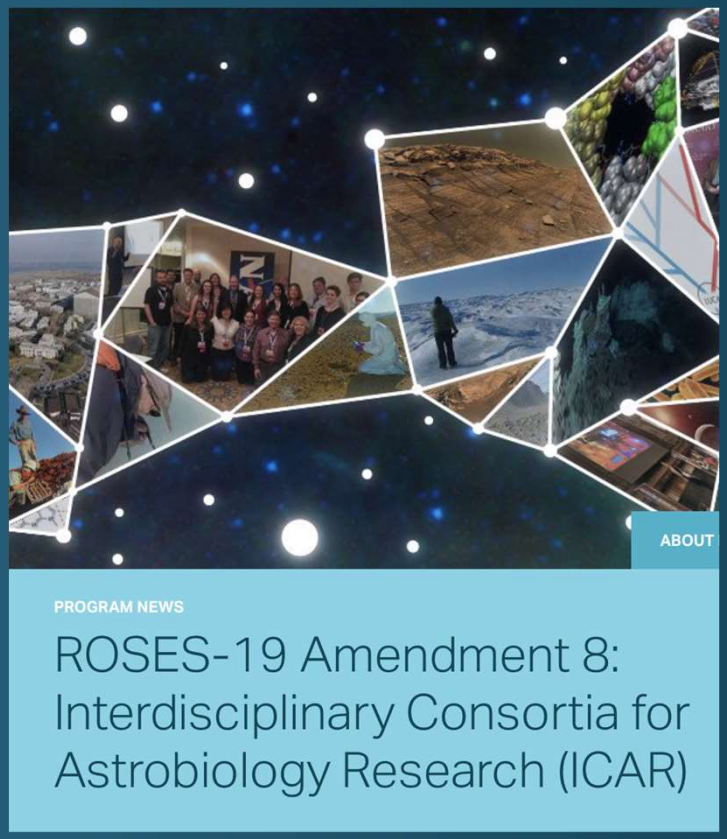
Exoplanet Research Program (XRP)

Changes to the program in ROSES19:

- HPD and ESD joined the program
- Review managed collaboratively by all four divisions
- Selections are funding-blind (i.e., not tied to specific Divisions)
- 20 percent more proposals than last year!

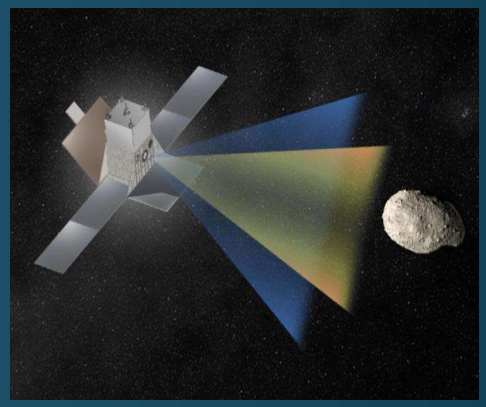
Anticipated changes coming in ROSES20:

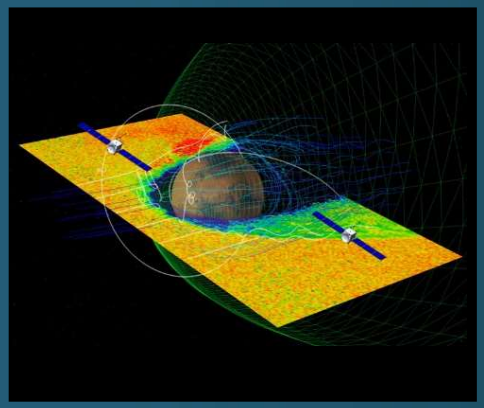
- Consolidation of exoplanet proposals into XRP
  - Within APD: exoplanet-related proposals from ADAP, ATP, etc. will move into XRP
  - Within PSD: exoplanet proposals in HW may move into XRP (better definition of the line between the two)
- Encourage further cross-divisional collaboration (HPD and ESD participation, in particular)

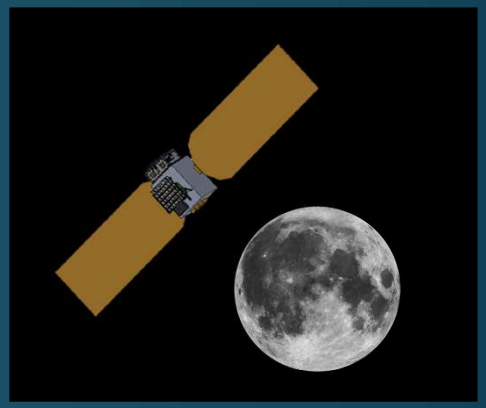


Astrobiology Research

- Solicitation: NNH19ZDA001N-ICAR
- To be released NLT October 2019
- Cycle will include:
  - prebiotic chemistry
  - early Earth environments
  - early life and increasing complexity
  - the habitability and biosignatures on exoplanets
- Selected proposals will become part of the Research Coordination Network







Announcements of Opportunity

Small Innovative Missions for Planetary Exploration (SIMPLEx)

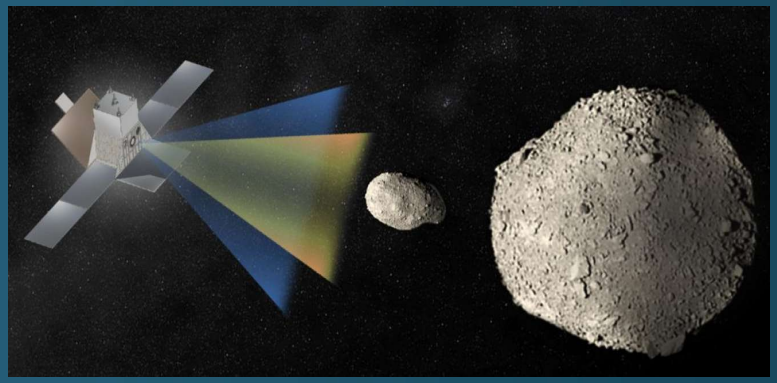
- Three missions selected for Phase A/B development
- Currently capturing lessons learned through PDR for consideration during next cycle
- Release of next opportunity planned for NET June 2020

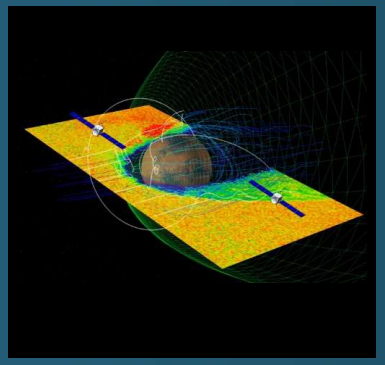
New Frontiers #4

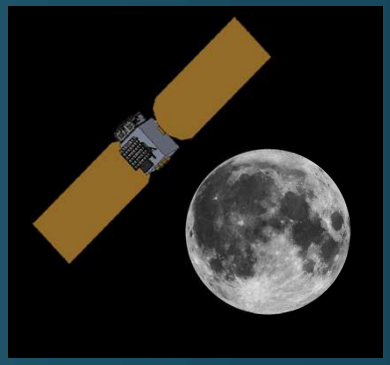
- Dragonfly selection announced June 27, 2019

Discovery 2019

- Step-1 proposals were due July 1, 2019, with selections scheduled for January 2020
- Step-2 selections planned for NET April 2021
- Dr. Tom Wagner named Lead Program Scientist for the Discovery Program







SIMPLEx Finalist Selections

NASA selected three finalists among a dozen concepts for future small satellites – at least one mission is expected to move to final selection and flight:

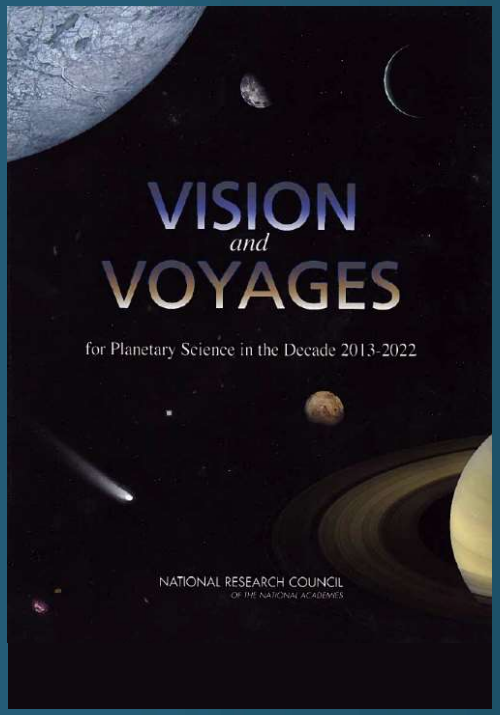
- **Janus Reconnaissance Missions to Binary Asteroids** to study the formation and evolutionary implications for small "rubble pile" asteroids and build an accurate model of two binary asteroid bodies
- **Escape and Plasma Acceleration and Dynamics Explorers (EscaPADE)** to characterize, on multiple scales, acceleration processes driving escape from Mars' atmosphere and how the atmosphere responds to the constant outflow of solar wind flowing off the Sun
- **Lunar Trailblazer** to directly detect and map water on the lunar surface to determine how its form, abundance, and location relate to geology

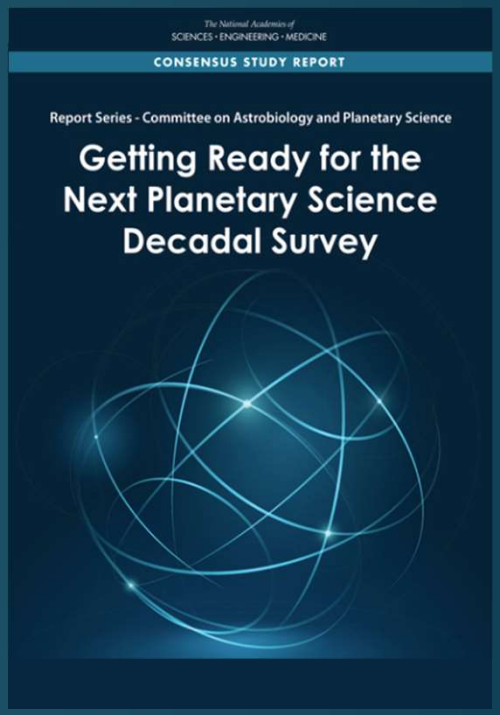
Inspire Future Leaders

- Achieve excellence by relying on diverse teams, both within and external to NASA, to most effectively perform SMD's work
- Attract and retain talent by promoting a culture that actively encourages diversity and inclusion and removes barriers to participation
- Encourage development of future leaders, including the next generation of mission principal investigators, through targeted outreach and hands-on opportunities
- Support early-career scientists to build careers working with NASA
- Engage the general public in NASA Science, including opportunities for citizen scientists

Mission Principal Investigator Development

- NASA Science has been exploring barriers to participation
- Workshop in Nov. 2018 explored issues and provided valuable feedback for forward work
  - Developed a consolidated PI resources webpage at https://science.nasa.gov/researchers/new-pi-resources
  - Introduced pre-reviews of mission peer review panels to ensure diversity and reduce conflicts of interest
  - Added a code of conduct requirement for SMD-funded conferences to ROSES 2019
  - Restarted proposal writing workshops at major science conferences
  - Included career development positions and associated evaluation criteria as part of Discovery and New Frontiers AOs
- SMD AA "Writing Successful Mission Proposals" colloquium live streamed on June 5, 2019
- Upcoming activities include
  - Information sessions at science conferences and stand-alone workshops to support those developing first proposal
  - First workshop will be held in Nov. 2019 in Tucson, Arizona, and information on how to register will be forthcoming
  - Sign up to learn more at https://lists.hq.nasa.gov/mailman/listinfo/hq-smdpi-workshop-outreach





Preparing for the Next Decadal Survey

- Mission concept studies proposals were due May 31, 2019
- Proposals were assessed by peer review panels this summer
  - 54 proposals received
  - 8-10 to be selected by end of Sept. 2019
- Results from concept study reports will be submitted to National Academies of Science, Engineering and Medicine (NASEM) to be included for consideration by the Decadal Survey
- Statement of Work currently in review
- Plan to initiate 2023 Decadal Survey in June 2020, with the final report to be delivered in 2022

Preparing for the Decadal

- Statement of Task in concurrence
- Conversation with NSF underway
- Invited the Planetary Assessment Groups (AGs) to provide thoughts on science questions and conversation regarding focus
- Met with NASEM Committee on Astrobiology and Planetary Science (CAPS) (September 10-11, 2019) in preparation for decadal survey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